THAT WHICH IS CLAIMED IS:

1. A method of processing telecommunications signals comprising the steps of:

transforming an original signal to produce an absolute value of the original signal;

transforming a delayed signal to produce an absolute value of the delayed signal;

applying a low pass filter to the absolute value of the original signal to provide an original-signal envelope estimate;

applying a low pass filter to the absolute value of the delayed signal to provide a delayed-signal envelope estimate; and

applying a delay estimation function to the original-signal envelope estimate and the delayed-signal estimate to provide an estimate of the delay between the original signal and the delayed signal.

2. A method according to claim 1 wherein the delay estimation function comprises an average magnitude difference function.

3. A method according to claim 1 wherein the delay estimation function comprises a correlation function.

4. A method according to claim 1 comprising the step of reducing the sampling rate of the original-signal envelope estimate and delayed-signal envelope estimate to provide a reduced original-signal envelope estimate and a reduced delayed-signal envelope estimate .

5. A method according to claim 4 wherein the delay estimation function is applied to a subset of the reduced original-signal envelope estimate and a subset of the reduced delayed-signal envelope estimate.

6. A method according to claim 5 comprising the step of storing in a first buffer the reduced original-signal envelope estimate and storing in a second buffer the reduced delayed-signal envelope estimate.

7. A method according to claim 6 comprising a step of updating the first and second buffers by removing an oldest sample from each buffer and adding a new sample to each buffer, thereby providing a continual estimate of the time delay.

8. A method according to claim 6 comprising a step of updating the first and second buffers by removing a predetermined number of samples from each buffer and adding a corresponding number of new samples to each buffer, thereby providing a continual estimate of the time delay.

9. A method according to claim 1 wherein the step of applying a delay estimation function comprises estimating a delay associated with an impulse response.

10. A method of processing telecommunications signals comprising the steps of:

transforming an original signal to produce an absolute value of the original signal;

transforming a delayed signal to produce an absolute value of the delayed signal;

applying a low pass filter to the absolute value of the original signal to provide an original-signal envelope estimate;

applying a low pass filter to the absolute value of the delayed signal to provide a delayed-signal envelope estimate;

applying a delay estimation function to the original-signal envelope estimate and delayed-signal envelope estimate to provide an estimate of the delay between the original signal and the

delayed signal.

11. A method according to claim 10 wherein the delay estimation function comprises an average magnitude difference function.

12. A method according to claim 10 wherein the delay estimation function comprises a correlation function.

13. A method according to claim 10 wherein the delay estimation function is applied to a subset of the reduced original-signal envelope estimate and a subset of the reduced delayed-signal envelope estimate.

14. A method according to claim 10 comprising the step of reducing the sampling rate of an original signal and a delayed signal to provide a reduced original-signal estimate and a reduced delayed-original estimate.

15. A method according to claim 14 comprising the step of storing in a first buffer the reduced original-signal envelope estimate and storing in a second buffer the reduced delayed-signal envelope estimate.

16. A method according to claim 15 comprising a step of updating the first and second buffers by removing an oldest sample from each buffer and adding a new sample to each buffer, thereby providing a continual estimate of the time delay.

17. A method according to claim 15 comprising a step of updating the first and second buffers by removing a predetermined number of samples from each buffer and adding a corresponding number of new samples to each buffer, thereby providing a continual estimate of the time delay.

18. A method according to claim 10 wherein the step of applying a

delay estimation function comprises estimating the delay associated with an impulse response.

19. An apparatus for estimating a delay in a telecommunication signal comprising:

an absolute value generator for producing an absolute value of an original signal and an absolute value of a delayed signal;

a filter means connected with the absolute value generator for altering the absolute value of the original and the delayed signals to provide an estimate of the original-signal envelope and the delayed-signal envelope; and

a delay estimation means for receiving the signal envelopes and for estimating the delay between the original signal and the delayed signal from the reduced original-signal envelope and the reduced delayed-signal envelope.

20. The apparatus of claim 19, further comprising a sample reduction means connected with the filter means for reducing the sampling rate of the signal envelope estimates to provide a reduced original-signal envelope estimate and a reduced delayed-signal envelope estimate.

21. An apparatus according to claim 20 comprising a first buffer for storing the reduced original-signal envelope estimate and a second buffer for storing the reduced delayed-signal envelope estimate, the buffers connected to the sample reduction means for receiving the reduced envelope estimates, and the buffers connected to the delay estimation means for providing the reduced envelope estimates to the delay estimation means.

22. An apparatus according to claim 20 wherein the delay estimation means is connected to the sample reduction means.

23. An apparatus according to claim 20 wherein the delay estimation means comprises an average magnitude difference function.

24. An apparatus according to claim 20 wherein the delay estimation means comprises a correlation function.

25. An apparatus according to claim 20 wherein the delay estimation means is responsive to a subset of the reduced original-signal envelope estimate and a subset of the reduced delayed-signal envelope estimate.

26. An apparatus according to claim 19 wherein the delay estimation means estimates the delay associated with an impulse response.

27. An apparatus for estimating a delay in a telecommunication signal comprising:

a sample reduction means for reducing the sampling rate of an original signal and a delayed signal;

an absolute value generator connected with the sample reduction means for producing an absolute value of the reduced original signal and an absolute value of the reduced delayed signal;

a filter means connected with the absolute value generator for altering the absolute value of the reduced original signal and the reduced delayed signal to provide an estimate of the original-signal envelope and the delayed-signal envelope; and

a delay estimation means for receiving the signal envelopes and for estimating the delay between the original signal and the delayed signal from the original-signal envelope estimate and the delayed-signal envelope estimate.

28. An apparatus according to claim 27 comprising a first buffer for storing the original-signal envelope estimate and a second buffer for storing the delayed-signal envelope estimate, the buffers connected to the filter means for receiving the envelope estimates, and the buffers connected to the delay estimation means for providing the envelope estimates to the delay estimation means.

29. An apparatus according to claim 27 wherein the delay estimation means is connected to the filter means.

30. An apparatus according to claim 27 wherein the delay estimation means comprises an average magnitude difference function.

31. An apparatus according to claim 27 wherein the delay estimation means comprises a correlation function.

32. An apparatus according to claim 27 wherein the delay estimation means is responsive to a subset of the original-signal envelope estimate and a subset of the delayed-signal envelope estimate.

33. An apparatus according to claim 27 wherein the sample reduction means comprises a decimation function.

34. An apparatus according to claim 27 wherein the delay estimation means estimates the delay associated with an impulse response.